



# Adaptation and Testing of Cognitive Behavioral Therapy Resource of Turkish Version to Reduce Dental Anxiety in Children

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## ABSTRACT

**Aim:** Dental anxiety is a common problem in pediatric dentistry and reducing it with improved communication is important. This study aimed to evaluate whether anxious children give similar answers in the dental office even though they have different cultural backgrounds and to assess the international usability of the cognitive behavioral therapy tool of the Turkish version of "Your Teeth You Are In Control" intervention including "Message to the Dentist" feedback form.

**Materials and Methods:** Two hundred and sixty-two children aged 5-15 years attending a faculty clinic and a private dental office were included in this study. The children were asked to complete the form to report how worried they felt and the levels of pain they experienced before and after their dental treatment on a scale of 1-10 (1=the best and 10=the worst outcome). Statistical analysis was performed with IBM SPSS V23.

**Results:** Most of the participants were worried about the needle, the dentist, and pain, respectively (38.2%, 34%, 28.2%). Most of the children raised their hand as a stop signal (94.7%). There was a statistically significant negative and weak correlation between age and anticipated pain, actual pain and anxiety scores ( $p=0.016, 0.003, 0.001$  respectively).

**Conclusion:** The "Message to the Dentist" feedback form and cognitive behavioral therapy resource can be used in pediatric dentistry to reduce dental anxiety in its Turkish version. It was useful to understand the sources of dental anxiety in children and this can facilitate treatment by helping pediatric dentists understand how these patients feel about dental treatment procedures and, via their efforts, to improve patient care.

**Keywords:** Dental anxiety, children, cognitive behavioral therapy, pediatric dentistry, behavioral management

## Introduction

Dental anxiety is a common problem which can be seen in both children and adults. It was stated that dental anxiety is more common in pre-school and school age children than in adolescents and it is mostly observed in

the 3-18 years old age group worldwide (1). Anticipation and fear of pain in dentistry can lead to dental anxiety and avoidance of dental treatment, and many techniques have been used for pain and behavioral management in pediatric dentistry. Behavioral guidance techniques aim to foster a

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positive dental attitude so oral healthcare can be provided for infants, children, adolescents and special healthcare needs patients (2).

While dental fear, dental phobia and dental anxiety are often described as being similar, they have different meanings and should be evaluated separately (3). Dental anxiety is an emotion that may occur after a negative dental experience or it is an apprehension caused by negative dental stories acquired or heard from other people (4). Dental fear is defined as a normal emotional response to a specific real dental stimulus. Dental phobia is an intense state of dental anxiety. These lead to an avoidance of dental care (3,5). Additionally, dental anxiety can be seen at any age, especially in childhood (2,5). This issue points out the need for extra effort and time to manage individuals with dental anxiety in pediatric dentistry (4). This fear, which can be seen in various forms in children, may result in untreated dental caries and periodontal diseases in children with this avoidance (5).

Advanced techniques such as general anesthesia and sedation are available for patients with dental anxiety. However, these techniques require appropriate equipment, adequate expertise and they are high cost. Therefore, they cannot be applied at all times and in all environments and behavioral management techniques are gaining importance today. At the same time, the foundations of fear acquired in childhood are carried over into adulthood (5-8). Therefore, it is important to manage these fears correctly.

Several measurement methods have been developed to evaluate dental anxiety. Apart from measuring with scales where fear is expressed and evaluated by facial expressions or numbers, measurement methods such as drawing pictures by children have also been used (9,10). In addition to these, in order to reduce dental anxiety, various methods such as dog therapy, music, visual distraction methods, commitment therapy, cognitive behavioral therapy (CBT), relaxation, massage, acupuncture/acupressure, natural sounds and humanoid robots have been used (11-14).

CBT is a short-term psychotherapy method focused on the current problems of the patients. In CBT, the therapist applies an instructive and structured therapy method to the patient to overcome those difficulties which cannot be overcome in daily life, to solve problems, and to deal with the here and now. Furthermore, it is aimed to increase

the awareness of the person, to eliminate disruptions caused by irrational thoughts in his/her life, and to replace the wrongly learned reactions with the truth (15). Relaxation exercises, breathing techniques, systematic desensitization, cognitive restructuring strategies and new behavior learning strategies are used to reduce anxiety as cognitive behavioral assessment tools (16-18). It has been reported that this technique can be preferred in many anxiety disorders as well as specific phobias such as dental anxiety or injection phobia. While dental anxiety is very common, research with CBT in children with dental anxiety is limited (6,19-21).

A CBT-based form named "Message to Dentist" (MTD) was first developed in 2017 by Porritt et al. (6). This form includes questions about anticipated pain, actual pain, anxiety levels, coping plans, stopping signals, reflections and rewards. It is used with patients both before and after dental treatment. In this form, patients are asked to rate their anxiety on a scale of one to ten (1 equals 'not scared at all') and to write down what they are worried about. The patient's expectations, wishes, how the dental examination and treatment was, and which stopping signal was preferred are asked. Moreover, patients are asked to rate their anticipated and actual pain levels on a scale of one to ten (1 is 'not painful at all'). The child is asked what they learned, what makes them feel good during the treatment, and which reward they would like next time. Porritt et al. (6) reported a significant decrease in Modified Dental Anxiety scores in children using the "Your Teeth You Are In Control" intervention with the MTD form. The "Your Teeth You Are In Control" intervention was adapted into Turkish and this was the first study to use the MTD form in Turkish children with dental anxiety. The aim of this study was to evaluate whether anxious children give similar answers in the dental office even though they have different cultural backgrounds and to assess the international usability of the MTD tool.

## Materials and Methods

This study protocol was approved by the Altınbaş University Clinical Research Ethics Committee (approval no: 2021/52, date: 04.03.2021) in accordance with the World Medical Association Declaration of Helsinki before the study. Written informed consents were obtained from the participants' parents/legal guardians before the study.

### **Turkish Translation and Adaptation of the “MTD Form”**

Firstly, the original MTD form was translated into the Turkish language by two specialist dentists and then reviewed by a lecturer from the English Department of the High School of Foreign Languages. Secondly, the English and Turkish version of the forms were sent to the researcher who created the original form and it was sent to a bilingual expert in the UK to be checked. After this stage, modifications were made in line with the recommendations given and it was applied to 30 (range=5 to 15 years) children during a two-week period. For those patients who were illiterate or had difficulty in understanding, the questions and information in the form were read to the patients by their parents or the dentist, and their answers were noted. A re-evaluation of the form was performed by two researchers and one of the developers of original form after these first and second stages. In the first version of this document, a few of the questions had problems regarding issues with Turkish socio-economic levels which could not be easily understood by the Turkish children if the document was translated word by word. For example, in the reward question, the answer part was not suitable for most Turkish children. Hence, a modification in the text was made to make it clear for the patients and some extra options were added. Additionally, most Turkish children generally sleep very late so the option of ‘going to bed late’ was not viewed as a reward for them. Also, golf, which was mentioned in the form, is not a common or easily accessible sport in our country and so it was removed. The children’s responses were evaluated in terms of cross-cultural adaptation in this process for appropriate and understandable word usage and the final Turkish version of the form was created. The MTD form is more of a communication tool as an invention rather than a scale, although there are some questions suitable for statistical analysis and others where free text is written. The English version of this form is shown in Figure 1.

Patients who were referred to Altınbaş University Faculty of Dentistry, Department of Pediatric Dentistry and another private dental office were included in this study.

### **Inclusion Criteria**

- Children,
- Aged 5-15 years,
  - Having dental anxiety but not having previous negative experiences during dental treatment in childhood or adolescence,
  - Without any systemic or mental disabilities,
  - Who volunteered to participate in this study and whose parental consent was obtained.

### **Exclusion Criteria**

- Children,
- Not in the age range of 5-15,
  - Who did not have dental anxiety,
  - Having a systemic or mental disability,
  - Having previous negative experiences during dental treatment in childhood or adolescence,
  - And those who did not volunteer to participate in this study or did not have parental consent for this study.

### **Testing of the MTD Form**

This study was completely on a voluntary basis. Written informed consent was obtained from the parents of the patients and verbal consent was obtained from the patients. This form was applied in a faculty clinic or a private dental clinic to children who had not had dental treatment before and who had dental anxiety findings according to the questions. Their parents were asked to help those children who were illiterate or could not understand the questions on their own.

Preference of the stopping signal, concordance and difference between anticipated and actual pain scores, relationships in terms of age, gender, and relationships in terms of dental office or faculty clinic were examined in this study. We aimed to improve children’s coping mechanisms and self-reflections with respect to dental treatment. Calibrations were performed by the examiners and the consistency of the evaluations was confirmed using a Kappa statistic. The Kappa for inter- and intra-examiner reliability was 0.94 and 0.91 respectively.

### **Statistical Analysis**

For the sample size calculation, the G\*Power (v3.1.9) program was used and when the effect size  $w$  (effect

**YOUR TEETH YOU ARE IN CONTROL**

**Message to Dentist**

1) This is how worried I feel on a scale of 1 to 10 where 1 is not being scared at all.

2) These are the things I am worried about  
.....

3) This is how painful I think it might be on a scale of 1 to 10 where 1 is not being painful at all

4) This is what I'd like to happen  
.....

5) This is what I don't want to happen  
.....

6) Things I plan to do:

<input type="checkbox"/> Play music or an audiobook	<input type="checkbox"/> Play a mind game in my head
<input type="checkbox"/> Imagine somewhere great	<input type="checkbox"/> Breathe and relax
<input type="checkbox"/> Squeeze a stress ball	<input type="checkbox"/> Do some maths in my head

7) Things I want you to do:

<input type="checkbox"/> Talk to me or explain or show me what you are doing
<input type="checkbox"/> Tell me how long it will actually take
<input type="checkbox"/> Other .....

8) Agree clear stop signals

If you want your dentist to stop, you need a way to let them know. This might be something like lifting up your left hand when you feel like a rest or you need to swallow. If you agree this with the dentist before you start treatment, it makes things much easier if you need a break.

Sometimes if your dentist is at a key point it may be important they finish off before stopping. If so, you need to agree that they give an idea of how much longer is needed. That's the time to use one of your Tools.

MY STOP SIGNAL IS: .....

Agreed by Me (sign) ..... Signed by (my dentist) .....

Date ..... Date .....

**Don't forget to take this message with you to your dentist next time you go. You can write a new message each time you visit if you want.**

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**YOUR TEETH YOU ARE IN CONTROL**

**How did it really go?**

When your treatment is nearly over, here are some questions that will help you give honest feedback. Your dentist will want that – so say it as it is. Think back on your experience and how things went. There may be things to ask your dentist to do differently next time - and now's the time to ask.

Here are some phrases you could use next time you talk to your dentist.

When you did this, it made me feel:  
.....

The best things that worked today were:  
.....

How painful actually was it on a scale from 1 to 10 where 1 is not being painful at all?

Feedback from your dentist. Ask your dentist to write how well they thought you did here:  
.....

Now, write down anything you don't want to happen again  
.....

How worried might I be next time on a scale from 1 to 10 where 1 is not being at all worried?

**So, what have you learnt?**

Tick the things that work for you...

<input type="checkbox"/> Having a plan.	<input type="checkbox"/> Using my Tools.
<input type="checkbox"/> Writing a Message to Dentist	<input type="checkbox"/> Taking things step by step.
<input type="checkbox"/> Using a stop signal.	<input type="checkbox"/> Asking for clear information.
<input type="checkbox"/> Having something to look forward to afterwards.	

Other: (write in) .....

**You've done well**

It's good to recognise that with a small reward. It's your choice – but be realistic. We're not talking a holiday abroad.

A treat might be to:

- Play your favourite game for an extra hour that evening.
- Watch your favourite TV programme.
- Stay up a little later tonight.
- Choose your next meal.
- Download a new app.
- Buy some music.

Not sweets or fizzy drinks 😊  
Choose something that will make you feel good. You deserve it.

My reward will be: .....

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**Figure 1.** English version of the MTD form

MTD: Message to Dentist

size)= 0.374 is taken, the number of samples for Power= 0.95 and  $\alpha$  (alpha)=0.05 was determined to be minimum n=142. Data were analyzed with IBM SPSS V23. Conformity to normal distribution was evaluated by Kolmogorov-Smirnov and Shapiro-Wilk tests. The Mann-Whitney U test was used to compare the data which were not normally distributed according to the paired groups. The intra-class correlation coefficient was used to examine the concordance between the anticipated pain and the actual pain scores. Spearman's rho correlation coefficient was used to examine the relationship between data which was not normally distributed. Bonferroni correction was used as multiple comparison to compare data according to multiple choice questions. Analysis results were presented as mean  $\pm$  SD for quantitative data. Categorical

data as deviation and median (minimum-maximum) were presented as frequency and percentage. The significance level was taken as  $p < 0.05$ .

## Results

The form was applied to 262 children. Over two thirds (69.1%) of the participants were in the faculty clinic and 30.9% were in the private practice. 50% of the participants were female and 50% were male. The average age of the children was  $8.33 \pm 2.04$  years. Most of the participants were worried about needles, the dentist, and pain, respectively (38.2%, 34%, 28.2%). Other causes of dental fear were seen at lower rates, namely: dental tools, the dental room, the unit light, opening the mouth, restorative treatment, root canal treatment,

the dental unit, bleeding, water leakage into the mouth, the LED light unit, sounds, further decay of teeth, water splashing onto the face, sharp tools which may prick the cheek, nausea when taking a dental impression, the long treatment time, being tickled, the impression material which may not fit in the mouth, the impression material which may cause choking, the dentist's uniform and suction. 40.1% of the participants stated that the dental examination/treatment did not hurt as much as they expected. 29% of them did not want any reward. The most requested rewards were listed as watching a favorite program, a new toy, going to the mall, taking a courage certificate, playing a favorite game for 1 hour extra, downloading a new game, and playing with a phone, respectively (11.5%, 10.3%, 5.3%, 5%, 5%, 4.6%, 4.6%). Ninety-four point seven per cent of the children raised their hand as a stop signal. Other preferred stop signals were listed as talking, shouting, closing the mouth, raising a foot, blinking, crying, hugging their mother, hugging the dentist or pushing hands against the dentist. The best things during dental examination/treatment according to the children's answers are shown in Table I.

There was a statistically significant negative and weak correlation between age and anticipated pain, actual pain and anxiety scores ( $p=0.016$ ,  $0.003$ ,  $0.001$  respectively). Table II represents this correlation.

The difference between the anticipated pain and actual pain was statistically different between males and females. Table III shows this difference and it is due to the sum of ranks which are greater in females.

It is shown in Table IV that as the anxiety level increases, both the anticipated and actual pain levels increase and the relationship between these two pain levels is moderate.

The children were found to be more worried in the dentist's office. Table V summarizes this, although there was no difference between the two groups (the dentist's office or the dental faculty) for actual pain, the patients felt more pain in the dental office when their anticipated pain was evaluated.

A statistically significant difference was found between the mean values of the anxiety scores according to the comments ( $p<0.050$ ). Table VI contains these values and

the highest mean value was obtained from the "non-cooperative patient" group (9.27), while the lowest mean value was obtained from the "very cooperative patient" group (2.19).

	<b>Frequency (n)</b>	<b>Percent (%)</b>
Best things*		
Did not hurt me, painless treatment	105	40.1
My teeth were treated	44	16.8
Nothing	19	7.3
My pain is over	16	6.1
Did not feel the injector	12	4.6
Treatment is over	10	3.8
Dentist told me everything	9	3.4
Looking at myself in the mirror	9	3.4
Treatment time was short	8	3.1
Having a break	8	3.1
Treatment was fine	5	1.9
Watching a cartoon film	5	1.9
I overcame my fear	5	1.9
My teeth are now white and more esthetic	4	1.5
Cleaning my teeth	4	1.5
Having a tooth examination	3	1.1
Receiving a reward	3	1.1
Stopping when I wanted	3	1.1
There was less nausea than I expected	2	0.8
Getting rid of my decayed tooth, cleaning my teeth	2	0.8
I was relaxed, taking a breath	2	0.8
I don't know	2	0.8
Looking at pictures	2	0.8
Getting a courage certificate	2	0.8
Extraction time was short and my dentist showed me the tooth	2	0.8
Water coming from the aerator	1	0.4
When my favorite music was playing, my fear level was reduced	1	0.4
Everything	1	0.4
*Multiple responses		

## Discussion

This study aimed to investigate the levels of dental anxiety before and after dental treatment using the MTD form as part of a CBT intervention. Additionally, it aimed to understand the factors which cause dental anxiety by analyzing the content of the previous MTD research and to test whether the CBT source works in eliminating anxiety, and understanding those factors which cause dental anxiety in order to improve Health Related Quality of Life (6,21,22).

The MTD form was used with children before dental treatment to record their anticipated levels of anxiety and pain. One of the positive aspects of this study was that it allowed the children to express their own feelings and thoughts. It was also beneficial to teach child patients the stop signal, to adapt to dental treatment, and to encourage them to think positively in order to motivate themselves to deal with dental anxiety. This study is important due to the limited number of studies on children with dental anxiety

related to cognitive methods (19-21,23).

In this study, the CBT method was used as a combination of some basic behavior management and communicative guidance techniques such as imagery and distraction, tell-show-do, and ask-tell-ask.

Imagery draws the child's attention away from the procedure, using imagination and storytelling. Distraction is an effective method used for pain and behavior management in pediatric dentistry and it is administered using cognitive or behavioral methods aimed at distracting attention from pain. On the cognitive side, there are methods such as counting, thinking nice things, and non-procedural talk, while on the behavioral side, methods such as videos, games and rewards can be used. The combined use of imagery and distraction has been shown to be helpful in reducing postoperative pain in children (24,25).

Tell-show-do introduces the dental hand pieces to the patient and familiarize them with the dental routine and shapes the patient's response to procedures (25).

The ask-tell-ask technique involves questioning the patient's feelings about the dental visit and any scheduled procedure (ask); explaining procedures according to the patient's cognitive level (tell); and again questioning (ask) how the patient understands and feels about the upcoming treatment (25).

CBT has a problem-focused and collaborative attitude which actively involves the patient in the process. Cognitive

**Table II. Relationship between age, pain and anxiety scores**

	Age	
	r	p-value
Anticipated pain	-0.148	<b>0.016</b>
Actual pain	-0.183	<b>0.003</b>
Pain difference	-0.006	0.925
Feeling worried	-0.202	<b>0.001</b>

r= Spearman's rho correlation coefficient

**Table III. Relationship between gender, pain and anxiety scores**

	Female		Male		Test statistic	p-value
	Mean ± SD	Med (min.-max.)	Mean ± SD	Med (min.-max.)		
Anticipated pain	4.28±3.73	2.00 (0.00-10.00)	4.08±3.85	1.00 (1.00-10.00)	U=8096.5	0.400
Actual pain	1.96±2.03	1.00 (0.00-10.00)	2.63±3.05	1.00 (1.00-10.00)	U=8064	0.299
Pain difference	2.32±3.35	0.00 (-5.00-10.00)	1.46±2.94	0.00 (-3.00-9.00)	U=7196.5	<b>0.010</b>
Feeling worried	5.53±3.77	5.00 (1.00-10.00)	5.02±3.91	5.00 (1.00-10.00)	U=7930.5	0.268

U: Mann-Whitney U test statistic  
Min.-max.: Minimum-maximum, SD: Standard deviation

**Table IV. Evaluation of relationship between pain scores and anxiety scores**

	r	p-value
Anticipate pain	0.785	<b>&lt;0.001</b>
Actual pain	0.474	<b>&lt;0.001</b>
Pain difference	0.527	<b>&lt;0.001</b>

r= Spearman's rho correlation coefficient

restructuring helps patients recognize and change false or unhelpful thoughts associated with emotional distress. It aims to eliminate fear by enabling a patient with anxiety to face the feared stimulus and situations in a planned manner (26).

In present study, the reward requests of the children were mostly related to digital content, such as watching television, playing their favorite game for an extra hour, playing with their phone, or downloading a new game, in addition to getting a new toy, going to the mall, or receiving a courage certificate. Part of this research took place during the Coronavirus disease-2019 pandemic, and due to this factor, the children may have wanted such rewards as they were mostly at home during this period and thought less of imaginative activities.

Dental injections, dentists, pain, and extractions were the things which scared the children the most. Although

most of the children who participated in this study had dental anxiety, they managed to complete their treatment. The children found their dental anxiety to be relieved by having a stop signal, taking breaks during the treatment, and being provided with explanations about the instruments and the procedure. Raising the hand, which is an example of one of the stop signals given to the children before the treatment, was the most preferred and used stop signal. The response of the children to the “best things” question was often “it didn’t hurt, and it was a painless treatment” as seen in Table I.

Despite the fact that no difference was found between actual pain and anticipated pain, it was thought that the reason patients felt more pain in the dental office was that the behavior guidance techniques were used more effectively by the pediatric dentists in the university pediatric dentistry clinic. Table V presents these clinical differences. It has been reported that children with severe anxiety and also in need

**Table V.** Relationship between dentist office/faculty clinic, pain and anxiety scores

	Dentist’s office		Dental faculty		Test statistic	p-value
	Mean ± SD	Med (min.-max.)	Mean ± SD	Med (min.-max.)		
Anticipate pain	5.70±3.91	5.00 (1.00-10.00)	3.50±3.53	1.00 (0.00-10.00)	U=4669	<0.001
Actual pain	1.90±1.73	1.00 (1.00-10.00)	2.47 2.90	1.00 (0.00-10.00)	U=6981	0.447
Pain difference	3.80±3.85	3.00 (-3.00-9.00)	1.03±2.38	0.00 (-5.00-10.00)	U=4327.5	<0.001
Feeling worried	6.83±3.56	8.00 (1.00-10.00)	4.58±3.77	5.00 (1.00-10.00)	U=4901	<0.001

U= Mann-Whitney U test statistic  
Min.-max.: Minimum-maximum, SD: Standard deviation

**Table VI.** Comparison of anxiety scores according to comments

	Feel worried	
	Mean ± SD	Med (min.-max.)
Comments*		
Non-cooperative patient	9.27±2.03a	10.00 (1.00-10.00)
Very cooperative patient	2.19±2.31b	1.00 (1.00-10.00)
I learned how to use the stop signal	6.53±3.52c	5.00 (1.00-10.00)
Cooperative patient	4.08±3.25c	4.50 (1.00-10.00)
I was relaxed, my dentist explained everything	5.06±3.76c	5.00 (1.00-10.00)
I like having treatment with breaks, step-by-step	7.05±4.08ac	10.00 (1.00-10.00)
Patient was afraid at first but then they were reassured and cooperative later	7.17±2.52ac	5.50 (5.00-10.00)
Other	5.33±3.72c	5.00 (1.00-10.00)
p-value	<0.05	

\*Multiple responses, a-f: No difference between groups with the same letter  
Bonferroni correction  
Min.-max.: Minimum-maximum, SD: Standard deviation

of urgent treatment should be referred to pediatric dentists who have the ability to choose between a multitude of treatment techniques and thus employ dental treatment more appropriate to the individuality of children with dental fear (27).

Anticipated pain, actual pain, and anxiety scores decreased and had a weak correlation with increasing age, compatible with Majstorovic et al.'s (28) and Popescu et al.'s (29) studies (30). The reason for this was thought to be the increase in cognitive perception levels of the children as they grow older, which enables them to control their reactions. It has been stated that dental anxiety in different age groups is related to different perspectives of dentistry and explained by the shift of dental anxiety from basic primary stimuli to more complicated causes (31,32).

Gender differences in dental fear in children are a widely researched topic. Some studies did not find a significant difference between boys and girls, but most of them reported that girls have more dental anxiety than boys (5,33-35). In the current study, girls had more dental anxiety than boys (Table III).

The results of this study indicated that as the anxiety levels increased, the actual and anticipated pain levels also increased, as summarized in Table IV. In another study, it was reported that less fear was felt in situations where pain was experienced personally, except for patients with high dental anxiety. This situation was considered to be triggered by the objectively distorted perception of the expected toothache before dental treatment in children with high stress and anxiety levels (35). This finding was compatible with the present study.

In another study using Internet-based CBT, it was reported that this method was feasible and effective for anxious children and adolescents in pediatric dentistry (36).

In a systematic review, it was stated that CBT reduces dental anxiety more effectively than various behavioral management techniques, but more studies are needed in children due to the low quality of this evidence (37).

### Study Limitations

The study was carried out in a single city and with a small population. However, despite this seeming limitation, Istanbul is a multicultural city of 20 million people who have emigrated from all of Turkey and a tool which works for

Istanbul can be applied all over Turkey. In addition, the fact that children do not have any difficulties in understanding and answering the questions and helping the dentist with their answers can be taken as an indication that this method is suitable for Turkish children.

In further studies, new information can be obtained with a larger sample group with more children, and this method's effectiveness may be compared with other techniques.

### Conclusion

It is important for pediatric dentists to be aware of new behavior management approaches and to use these techniques to improve their patients' experiences of dental care.

The MTD form and CBT resource can be used in pediatric dentistry to reduce dental anxiety of children in Turkey. It was useful to show how children's anticipated fear and pain levels reduced following treatment and to identify the specific causes of their concern. This method of understanding and correcting the source of dental anxiety in children can facilitate treatment by helping pediatric dentists understand how these patients feel about dental treatment procedures and to guide their efforts in order to improve patient care.

The Turkish version of the MTD form has been used successfully similar to the original version. As in cases of its successful use in other languages or cultures, this version can also be considered an international supportive method for dentists in the treatment management of patients with anxiety.

### Ethics

**Ethics Committee Approval:** This study protocol was reviewed and approved by the Altınbaş University Clinical Research Ethics Committee (approval number: 2021/52, date: 04.03.2021) in accordance with the World Medical Association Declaration of Helsinki before the study.

**Informed Consent:** Written informed consents were obtained from the participants' parent/legal guardian and the study protocol was approved by the institute's committee on human research.

**Peer-review:** Externally peer-reviewed.

### Authorship Contributions

Design: A.T.G., Z.M., Data Collection and/or Processing: A.T.G., E.A.T., B.A., G.E., Analysis and/or Interpretation:

A.T.G., B.Ö., Z.M., Critical Review and Editing: Z.M., B.Ö., Writing: A.T.G., E.A.T.

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